STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

DEPARTMENT OF TRANSPORTATION
ENGINEERING SERVICE CENTER
Transportation Laboratory
5900 Folsom Boulevard
Sacramento, California 95819-4612

METHOD OF TEST FOR THE POWER LINE TRANSIENT SUSCEPTIBILITY

CAUTION: Prior to handling test materials, performing equipment setups, and/or conducting this method, testers are required to read **"SAFETY AND HEALTH"** in Section G of this method. It is the responsibility of whoever uses this method to consult and use departmental safety and health practices and determine the applicability of regulatory limitations before any testing is performed. Users of this method do so at their own risk.

A. SCOPE

This test method descibes the procedure for determining the ability of a traffic control system to maintain normal operation when subjected to power line transients.

B. SPIKES

1. Peak amplitude of plus or minus 300 volts added synchronously to the AC line.

2. Shall be capable of moving uniformly over the full wave (360º) of the line voltage.

3. Shall be capable of moving either automatically over the 360º once every three seconds or manualy when necessary. In manual operation it may be stopped at any point where improper operation of the equipment under test may occur.

4. Peak noise power shall be 5 kilowatts with a rise time of 500 nanoseconds.

5. Rate of application variable from once every other cycle to once every five seconds.

B. APPARATUS

Line noise generator Berkeley Model 3021 or equivilent with the following characteristics:

1. Generator is an in line device (device under test gets it's AC line input from the generator) with greater than 30 dB isolation between line input and power/noise output.

2. Meter which measures greater than one microsecond width peak noise spike at the generator output. Meter accuracy must be ± 5 %.

3. Spike must have the same damped oscillatory response characteristic as the Model 3021 over the range of the load impedances.

4. Must be capable of all other characteristics listed in B (Spikes).

D. TEST PROCEDURE

1. Arrange and connect the equipment as shown in Figure 1.

2. Automatic Sweep Mode: Set the noise power for a maximum meter reading of

300 volts with the phase angle control in the automatic scan mode. All of the functions and sequences of the device under test shall be checked.

3. Manual Sweep Mode: Manualy turn the phase angle control through the full adjusting the noise power so that the meter reads 300 volts. This process is repeated for all funtions and sequences.

4. The rate of application will be set to the following:

   a) 100 ms, 300 ms, 500 ms and 1 second (all values ± 50 ms).

   b) May be tested from approximately 32 ms through 5 seconds and may be applied manually.

   Test proceedures 2 and 3 will be repeaded for the above rates.

5. Procedures 2 through 4 will be repeated for both positive and negitive spikes.

E. TEST RESULTS

The equipment shall be deemed to have failed the above test if its operation or component parts are affected in any manner. In the case of traffic controllers or solid state load switches, the associated lamp system shall not exhibit any visual blinking during the test.

F. REPORTING OF RESULTS

Report the test results on Form T-6039

G. SAFETY AND HEALTH

Prior to handling, testing or disposing of any waste materials, testers are required to read: Part A (Section 5.0), Part B (Sections: 5.0, 6.0 and 10.0) and Part C (Section 1.0) of Caltrans Laboratory Safety Manual.

End of Test (California Test 667 contains 2 pages)

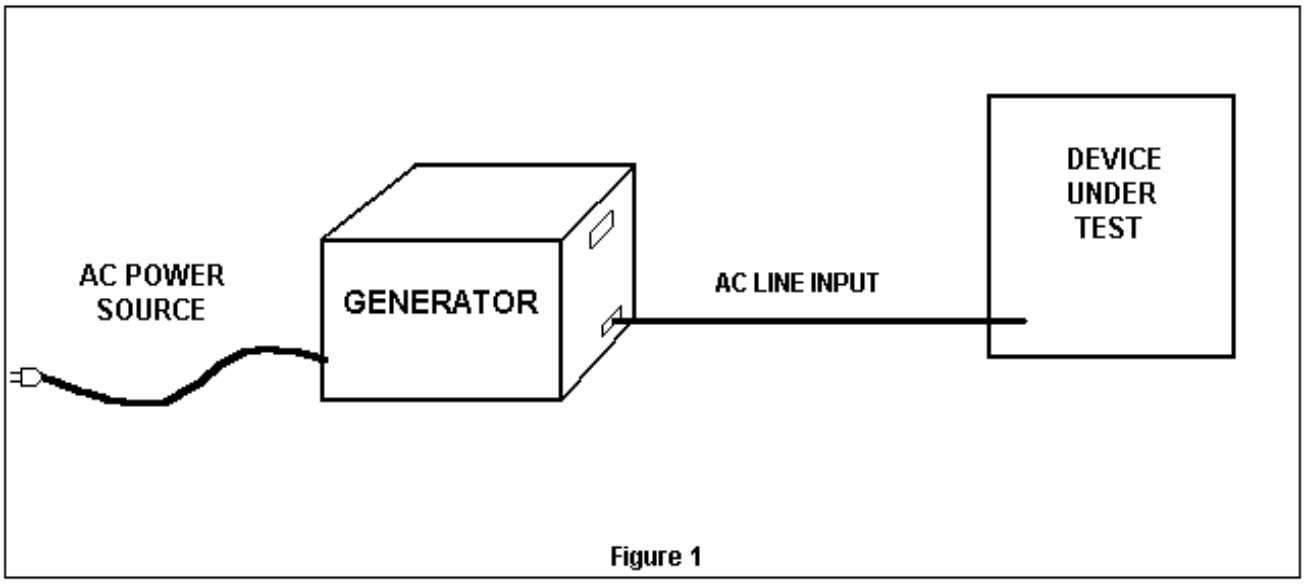

Figure 1